

**CALIFORNIA DEPARTMENT OF TRANSPORTATION**



**Independent Assurance Program  
Annual Report  
Calendar Year 2013**

**Division of Engineering Services  
Materials Engineering and Testing Services  
Transportation Laboratory  
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# California Department of Transportation Independent Assurance Program Annual Report Calendar Year 2013

## 1. OVERVIEW

### 1.1. INTRODUCTION

Title 23 of the *Code of Federal Regulations*, Chapter I, Part 637, Subpart B, Section 637.205(a) (23CFR637.205(a)), the Federal Highway Administration's (FHWA's) quality assurance procedures for construction require the following:

Each STD [state transportation department] shall develop a quality assurance program which will assure that the materials and workmanship incorporated into each Federal aid highway construction project on the NHS [National Highway System] are in conformity with the requirements of the approved plans and specifications, including approved changes.

Key components of this quality assurance program are "acceptance" and "independent assurance." Independent Assurance (IA) programs may be project or system based. The California Department of Transportation (Caltrans) has chosen to implement a system based IA program.

Agencies choosing to implement a system based IA Program are required by 23CFR637.207(a)(2)(iv) to submit an annual report. In fulfillment of this requirement, this report is being submitted concerning activities of the Caltrans IA Program for calendar year 2013.

## 1.2. ANNUAL REPORT OVERVIEW

The Caltrans Independent Assurance (IA) Program provides a framework for ensuring that the quality assurance program, as outlined in the Caltrans *Construction Manual* and in project specifications, is supported by qualified technicians and accredited laboratories. The Caltrans IA Program provides periodic evaluation of the performance of sampling and testing personnel, testing equipment, and testing laboratories.

The purpose of this document is to provide:

- A discussion of IA activities from January through December 2013
- A discussion of the current IA Program
- Information on the Reference Sample Program (RSP)

## 1.3. SUMMARY OF ACTIVITIES: CALENDAR YEAR 2013

- **New IA Staff Certification** – Two new IA staff were certified by Materials Engineering and Testing Services (METS) in 2013.
- **District IA Staff Recertification** – METS IA staff recertified 33 district IA and local assistance IA staff.
- **The 2013 Annual IA Meeting** - The 2013 Annual IA Meeting was held on December 17, 2013. New qualification programs such as inertial profiler operator certification and gamma-gamma logging qualification were discussed. In addition, new test methods planned for 2014 were also discussed.
- **District Process Reviews** - METS IA staff conducted IA process reviews in the 12 districts.
- **Technician Qualification** – Materials Engineering and Testing Services (METS) IA staff, district IA and local assistance staff qualified a total of 2657 technicians in Caltrans, local agencies and commercial laboratories.
- **Laboratory Accreditation** - METS IA staff, district IA staff and local assistance IA staff accredited a total of 438 Caltrans, local agency and commercial laboratories.
- **Equipment Calibration by METS IA Staff** – METS IA staff calibrated large equipment in 11 Caltrans laboratories and 2 local agency labs.
- **Reference Sample Program (RSP)** - The Reference Sample Program sent out course aggregate proficiency samples to 341 participating laboratories.
- **Local Assistance IA Staff** – Local Assistance IA staff reviewed 11 Quality Assurance Plans (QAP) for cities and counties in 2013.



## 2. CALTRANS INDEPENDENT ASSURANCE (IA) PROGRAM

### 2.1. BACKGROUND

Since 1992, Caltrans has been committed to an IA program. Guidance for the program is outlined in the *Caltrans Independent Assurance Manual*, which can be located at the following website address:

<[http://www.dot.ca.gov/hq/esc/Translab/ormt/IA\\_reports/IAP.htm](http://www.dot.ca.gov/hq/esc/Translab/ormt/IA_reports/IAP.htm)>

In 1994, Caltrans shifted from a project based process for reviewing technicians, equipment, and results to a system based process. In the system based process, a technician's qualifications are ascertained by written examinations, witnessed performance of tests, and results of testing on split samples of materials for corroboration of test results. Caltrans IA staff reviews equipment and laboratories annually; and laboratories participate in a statewide proficiency sampling program. 23CFR63.207(a) provides that this approach removes the necessity of project specific samples.

Caltrans views independent assurance as an important and integral part of its quality assurance program, but separate from individual project quality assurance efforts. Independent assurance is implemented by METS. The Division of Construction ensures individual project quality assurance. Quality assurance at the project level is outlined in the *Construction Manual*, which is located at the following website address:

<<http://www.dot.ca.gov/hq/construc/constmanual/>>

In keeping with the requirements of the IA Program and 23CFR637, Section 6-102 C(2) of the *Construction Manual* instructs the construction engineer that:

*All acceptance testers require certification. No tests or samples are to be taken on Caltrans projects unless the tester is certified in the test being performed.*



District	Certified IA Staff			Number of Technicians Qualified			Accredited Laboratories												Total		
							Caltrans			Local Agencies			Private Industry								
	2013	2012	2011	2013	2012	2011	2013	2012	2011	2013	2012	2011	2013	2012	2011	2013	2012	2011			
1	2	3	3	56	62	72	12	11	10	2	1	0	5	5	7	19	16	17			
2	4	4	4	158	153	142	8	8	8	1	1	1	15	15	16	24	24	25			
3	3	3	3	251	208	155	11	15	15	0	0	0	20	25	26	31	40	41			
4	5	4	4	264	347	494	8	8	7	0	0	0	21	17	18	29	25	25			
5	1	1	1	143	155	173	11	11	11	1	1	2	14	16	19	26	28	32			
6	3	3	3	239	224	193	5	6	5	2	2	2	26	29	25	33	37	32			
7	3	3	4	193	304	200	16	17	14	0	6	0	15	19	27	31	42	41			
8	2	2	2	386	351	369	8	6	6	1	1	1	28	31	37	37	38	44			
9	1	1	1	36	32	28	1	2	2	0	0	0	5	6	6	6	8	8			
10	2	2	2	215	219	230	6	5	4	0	0	0	17	16	18	23	21	22			
11	2	2	2	150	269	288	19	19	19	0	1	1	37	35	35	56	55	56			
12	2	2	2	145	266	185	3	4	4	1	1	1	26	30	29	30	35	34			
Total of all Districts	30	30	31	2236	2590	2529	108	112	105	8	14	9	229	244	263	345	369	377			
Total For HQ IA	1	1	1	32	40	21	0	0	0	1	2	1	3	5	6	4	7	7			
Total for Local Assistance IA	4	4	4	389	297	305	0	0	0	21	15	17	68	49	53	89	64	70			
Total for Districts and Headquarters	35	35	36	2657	2927	2855	108	112	105	30	31	27	300	298	322	438	440	454			

TABLE 1: IA PROGRAM DATA FOR 2013

### **3. CALTRANS IA PROGRAM IN 2013**

Shown in Table 1 is a summary of certified Caltrans IA staff, qualified technicians, and accredited laboratories for 2013.

#### **3.1. NEW IA STAFF CERTIFICATION**

Two new IA staff was certified in 2013.

#### **3.2. ANNUAL RECERTIFICATION OF STATEWIDE IA STAFF**

METS IA staff recertifies statewide IA staff on an annual basis. In 2013, METS IA staff recertified 33 district IA staff and Local Assistance IA staff. Statewide IA staff reviewed Superpave volumetric calculations and ASTM D 7741-11, “Standard Test Method for Measurement of Apparent Viscosity of Asphalt-Rubber or Other Asphalt Binders by Using a Rotational Hand Held Viscometer.” Written exams were administered on both topics.

In addition, METS began training statewide IA staff on CT 383, “Method of Test for Measurement of Pavement Macrottexture by Sand Patch.” This is a new test method that will be used by Caltrans in 2014.

#### **3.3. 2013 IA ANNUAL MEETING**

The IA Annual Meeting was held on December 17, 2013. FHWA, METS, district IA staff, local assistance IA staff and District Materials Engineers were in attendance. Attendance by IA staff is mandatory for IA recertification.

The following topics were covered:

- Overview of IA program in 2013
- 2013 Reference Sample Program
- New qualification programs for 2014
  - CT 383 – Sand Patch Test
  - Inertial profiler operator certification
  - Gamma-gamma logging technician qualification
- Independent Assurance Manual update
- District and Local Assistance IA issues

#### **3.4. DISTRICT IA PROCESS REVIEW/DISTRICT LAB REVIEWS**

The *Independent Assurance Manual* requires an annual process/peer review to verify district compliance with Caltrans policies regarding independent assurance. The review consists of an examination of IA documents, records and procedures. METS IA staff conducts the review of

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the district IA program implementation. These reviews are intended to promote statewide uniformity in the Caltrans IA Program.

IA files in the districts were reviewed by METS IA staff in 2013. In general, all districts have improved their filing systems. METS IA staff will continue to conduct process reviews in 2014.

### **3.5. TECHNICIAN QUALIFICATION**

District IA staff, METS IA staff and local assistance IA staff qualified a total of 2657 technicians in 2013. This is a decrease from the 2927 technicians accredited in 2012.

#### **3.5.1 TECHNICIAN DISQUALIFICATIONS**

Seventeen (17) technicians were disqualified by statewide IA staff due to use of improper test procedures. In most cases, the technician qualifications were suspended until a deficiency was corrected. After the correction was made, the qualification was reinstated.

### **3.6 LABORATORY ACCREDITATION**

In 2013, METS IA, district IA staff and local assistance IA staff accredited a total of 438 Caltrans, local agency and commercials laboratories. This is consistent with the 440 laboratories accredited in 2012.

#### **3.6.1 LABORATORY ACCREDITATION, REVOCATION AND DISPUTE RESOLUTION**

Section 2.5, “Dispute Resolution” of the *Caltrans Independent Assurance Manual* states:

“A tester or laboratory may have its entire qualification or accreditation or its qualification or accreditation for specific test methods suspended or revoked if it is found not to conform to IA accreditation requirements.”

In 2013, one laboratory had its accreditation revoked due to submitting improper paperwork. Due to the egregious nature of the infraction, the accreditation was revoked for one year.

Nine additional laboratories had accreditations revoked in various test methods. In some cases, the dispute resolution process was used. In general, the laboratory addressed its deficiencies and the accreditation was reinstated.

### **3.7 CALTRANS LABORATORIES— EQUIPMENT AND CALIBRATION**

Since 2002, METS has been instrumental in providing funding for testing equipment for the District Laboratories and Construction field laboratories throughout the state. With the move towards Superpave mix design, all the district laboratories have received Superpave gyratory

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compactors. Seven districts and the Southern Regional Laboratory (Districts 7, 8 and 12) have received Hamburg Wheel Track test machines. The remaining two districts will receive this equipment in 2014.

### **3.7.1 PROPER CALIBRATION OF TESTING EQUIPMENT**

A METS IA staff person calibrates all large Hveem related testing equipment in the district laboratories. This ensures that all Caltrans' large testing equipment is being calibrated uniformly.

In 2013, METS IA staff calibrated large equipment in 11 Caltrans and 2 local agency laboratories. With the move towards Superpave, METS will no longer perform calibration of Hveem related equipment in the districts. METS is developing a contract to deal with calibration of testing equipment. This calibration contract is planned to be completed by mid-2014.

For smaller equipment, local IA staff is responsible for verifying the calibration of all testing equipment in accredited field laboratories. In some districts, IA staff is responsible for calibration of equipment in the district and field laboratories. In other districts, IA staff reviews the calibration records for district and field laboratories from private calibration services.

Overall, all calibration records are reviewed by district IA staff, whether they are directly responsible for calibration of the equipment or not. The *Independent Assurance Manual* covers calibration procedures for equipment such as larger presses, scales and ovens.

## **3.8 CALTRANS REFERENCE SAMPLE PROGRAM (RSP) IN 2013**

The *Independent Assurance Manual*, Section 2.4.4, "Proficiency Testing" states,

*"The laboratory shall participate in all required proficiency sample programs to be accredited."*

It is the laboratory's responsibility to maintain active status in proficiency testing of reference samples by testing and reporting the results. Reference sample results are evaluated using a statistical evaluation system for determining the numerical ratings of each test method as detailed in the *Independent Assurance Manual*.

In 2013, samples of course aggregate were distributed to 341 participating laboratories (248 private, 70 Caltrans and 23 local agencies). While RSP laboratory staffing was not an issue this year, equipment problems limited the production of samples. Further delays in the program were also caused by lack of initial response from participating laboratories and late result reporting by laboratories. This resulted in delays in evaluation of data and reporting of results back to participating laboratories.

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At this time, there are still issues with laboratories reporting unacceptable results. The IA staff is working with these laboratories to address deficiencies. Therefore the report for the 2013 RSP will be included in the 2014 Caltrans IA Annual Report.

### 3.8.1 GOALS FOR THE RSP IN 2014

The following table gives an approximate timeline for the 2014 RSP sample distribution:

2014	Sample Type
January – April	HMA
May – August	Fine Aggregate
September – December	Portland Cement Concrete

TABLE 2: PROPOSED RSP SAMPLES FOR 2014

## 3.10 LOCAL ASSISTANCE IA PROGRAM

Chapter 16, Section 16.14, “Quality Assurance Program,” of the Caltrans Local Assistance Procedures Manual, states “**local agencies must follow Caltrans Quality Assurance Procedures (QAP) for all projects on the NHS**”. Therefore, for local agency projects on the NHS, Caltrans IA staff is responsible for providing IA services to local agencies.

Five local assistance IA staff positions were filled in December 2008. Implementation of the Local Assistance IA program began in March 2009. Local Assistance IA staff interacts on a regular basis with the district local assistance engineer (DLAE).

In 2013, local assistance IA staff qualified 421 testers in 93 accredited local agency and private laboratories. These numbers have increased steadily since the program started in 2009.

In addition to providing IA services, the Local Assistance IA staff reviews local agency Quality Assurance Program (QAP) manuals for compliance with Caltrans Local Assistance requirements. Eleven (11) local agency QAP manuals were reviewed by Local Assistance IA staff. QAP manuals are required to be updated every five years. Local assistance IA staff began the QAP manual review in 2009, so it is anticipated that a majority of the QAP manuals will require renewal in 2014.

## 4.0 CALTRANS IA HIGHLIGHTS FOR 2013

### 4.1 SUPERPAVE MIX DESIGN IMPLEMENTATION BY 2014

Superpave mix design implantation is on track for 2014. IA staff throughout the state has received training on Superpave mix design volumetrics. In 2013, IA staff started to issue

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proficiency certificates in AASHTO test methods for technicians and laboratories that work on Caltrans Superpave mix design projects.

## **4.2 IA MANUAL REVISIONS**

Revisions to the 2005 Caltrans Independent Assurance Manual started in mid-2013. The first draft copy of the revised manual was distributed at the December 2013 annual meeting. The manual rewrite will continue in 2014.

## **4.3 AASHTO ACCREDITATION OF CALTRANS DISTRICT MATERIALS LABORATORIES**

In the past, the main Transportation Laboratory in Sacramento was accredited by AMRL and CCRL, and the district labs were under the umbrella of the Sacramento accreditation. However, the district laboratories began the AASHTO accreditation process in 2012.

In 2013, the District 6 Materials laboratory and the Southern Regional laboratory received AASHTO accreditation. In 2014, District 1 and District 4 will begin the AASHTO accreditation process.

## **4.4 ADDITIONAL ACCREDITATION PROGRAMS IN 2013/2014**

Additional accreditation programs are being developed by Caltrans branches outside of Construction. IA staff has been instrumental in the launching of these programs as the qualification providers. In 2013, two additional programs were developed.

### **Inertial Profiler Operator Certification Program**

The Pavement Program in the Division of Maintenance has developed a certification program for inertial profiler equipment and operators to support the pavement smoothness specification implementation. The certification program consists of a written exam and a practical demonstration of the following: the block test, the bounce test and distance measurement instrument test. In 2013, METS IA staff qualified 21 operators and certified 8 pieces of equipment in support of the certification program. The responsibility to maintain the certification program will be disseminated to the district IA in 2014.

### **CT 233, “Method of Ascertaining the Homogeneity of Concrete in Cast-In-Drilled-Hole (CIDH) Piles Using the Gamma-Gamma Test Method”**

The Office of Geotechnical Support has developed a qualification program for testers and laboratories testing Cast-In-Drilled-Hole piles using the gamma-gamma test method. The program consists of a written exam and a practical field exam. In 2014, METS IA staff will begin to qualify testers in CT 233.

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### **CT 383, “Method of Test for Measurement of Pavement Macrotexture by Sand Patch”**

The Office of Structure Construction (OSC) is developing a standard special provision to correlate the CT 383 mean texture depth data to the California Portable Skid Test coefficient of friction data to expedite the opening of bridge decks treated with polyester concrete or methacrylate. This is a short term remedy to address resource issues regarding California Portable Skid testing by state forces.

The long term plan by the Office of Roadway Materials Testing and OSC is to develop working plans for the portable skid tester and to ultimately transfer portable skid test responsibility to the Contractor. To prepare for this transition, MET IA staff is in the process of developing a California Portable Skid Test Qualification program that will qualify the tester and ensure the testing machine is calibrated on a regular basis by METS. It will consist of a written exam in operation and calibration, a field practical exam and the fulfillment of testing machine calibration requirements.

In 2013, METS IA staff trained statewide IA staff for four districts in CT 383. Additionally, 39 students were trained in test method CT 383.

## **5.0 CALTRANS IA GOALS FOR 2014**

The main goals for the IA Program are as follows:

- IA Manual update to include the changes in practices for the program
  - Update the written exams to include new test methods and to reflect test method updates
  - Statewide IA staff recertification in the Caltrans lab procedures
  - Develop and implement the California Portable Skid Test qualification program
-